# Grid-Connected PV Capacity (kW) Installed in California

California Energy Commission*	19,516
Sacramento Municipal Utility District	11,169
Los Angeles Department of Water and Power	5,841
California Public Utilities Commission*	4,550
Pre-1998	1,918
City of Riverside Public Utilities	301
City of Anaheim Public Utilities	245
City of Palo Alto Utilities	223
City of Roseville Electric	93
City of Pasadena Water and Power	84
City of Santa Clara Electric Utility	54
City of Glendale Water and Electric	19
Pacific Power	19
City of Burbank Water and Power	7
City of Ukiah Public Utilities	7
City of Alameda Power and Telecom	5
City of Lodi Electric Utility	4
City of Redding Electric Utility	2

**TOTAL** 44,054 kW

44.05 MW

This analysis tracks the capacity of grid-connected PV installations in California from 1981 until the present. The vast majority of the early installations can be attributed to the work done by the Sacramento Municipal Utility District (SMUD). Beginning in 1998, the Energy Commission's Emerging Renewable ("Buydown") Program began offering rebates for grid-connected "emerging" systems in the service territories of the three biggest Investor Owned Utilities (IOUs) - PG&E, SCE and SDG&E. In 2001, the Public Utilities Commission began the Self-Generation Incentive Program. The "Self-Gen" Program also offers rebates, but the program is administered by the utilities (PG&E, SCE, SDG&E and SCGC) directly. The Los Angeles Department of Water and Power (LADWP), as well as many of the smaller utilities, offer there own incentive programs.

<sup>\*</sup> The Energy Commission's Emerging Renewable Program is open to the ratepayers of PG&E, SCE and SDG&E. The Public Utilities Commission's Self-Generation Incentive Program is open to the ratepayers of PG&E, SCE, SDG&E and the SCGC.

### Grid-Connected PV Capacity Installed in California

#### YEAR

	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003**	Total	
Program																									
Sacramento Municipal Utility District	0	0	0	1,230	٥	1,230	٥	0	0	0	٥	23	495	675	561	421	405	236	1.220	1,446	1.679	1,390	158	11.169	
California Energy Commission*	0	ő	ő	0	0	0	0	o o	o o	Õ	0	-0	0	0.0	0		.00	181	620	726	4.036	8,108	5.846	19,516	
Pacific Gas and Electric	. 0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	61	360	487	2,041	4,949	3,686	,	11,583
Southern California Edisor	o o	ō	ō	ō	ō	ō	ō	ō	ō	ō	ō	ō	ō	ō	ō	ō	ō	120	250	133	1,120	2,116	1,352		5,091
San Diego Gas and Electric	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	11	106	866	1,042	805		2,830
Bear Valley Electric	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	10	0	2		
Los Angeles Department of Water and Power	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	102	432	589	2,573	2,145	5,841	
California Public Utilities Commission*																					0	1,859	2,691	4,550	
Pacific Gas and Electric		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1,671	1,247		2,918
Southern California Edisor		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	114	513		627
San Diego Gas and Electric		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	74	931		1,005
Southern California Gas Company		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0
Pre-1998	37	38	11	12	15	63	0	4	59	15	17	477	806	-336	-250	378	110	464	0	0	0	0	0	1,918	
City of Palo Alto Utilities	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	16	16	99	74	17	223	
City of Santa Clara Electric Utility	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	34	14	4	54	
City of Pasadena Water and Power	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	84	0	84	
City of Burbank Water and Power	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	7	0	7	
City of Anaheim Public Utilities	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	141	84	19	245	
City of Redding Electric Utility	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	2	
City of Glendale Water and Electric	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	19	0	19	
City of Riverside Public Utilities City of Roseville Electric	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	113	15	173	301	
Pacific Power	0	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	9	0	0	54	29	93	
City of Alameda Power and Telecom	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	10	9	0	19	
City of Ukiah Public Utilities	0	0	0	0	0	0	0	0	0	U	0	0	0	0	0	0	0	4	0	0	0	1	0	2	
City of Lodi Electric Utility	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6	1	,	
City of Loui Electric Offinty	0	0	U	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	0	0	4	
TOTAL	37	38	11	1,242	15	1,293	0	4	59	15	17	500	1,301	339	311	799	515	885	1,967	2,622	6,705	14,298	11,084	44,054	
Cumulative Total	37	75	86	1,328	1,342	2,635	2,635	2,639	2,698	2,713	2,730	3,230	4,530	4,869	5,180	5,980	6,494	7,379	9,346	11,968	18,673	32,970	44,054		

#### NOTES

\* The Energy Commission's Emerging Renewable Program is open to the ratepayers of PG&E, SCE and SDG&E. The Public Utilities Commission's Self-Generation Incentive Program is open to the ratepayers of PG&E, SCE, SDG&E and the SCGC.

\*\* The 2003 data is current as of June/July 2003.

"Pre-1998" Row: These numbers were derived by subtracting the total kW installed by SMUD each year from the totals contained in Appendix A of the 2001 EPRI Report titled "California Renewable Technology Market and Benefits Assessment." In some years, there is a negative number. This obviously did not happen. To be consistent with the EPRI data, it was decided to keep the negative number rather than make more assumptions.

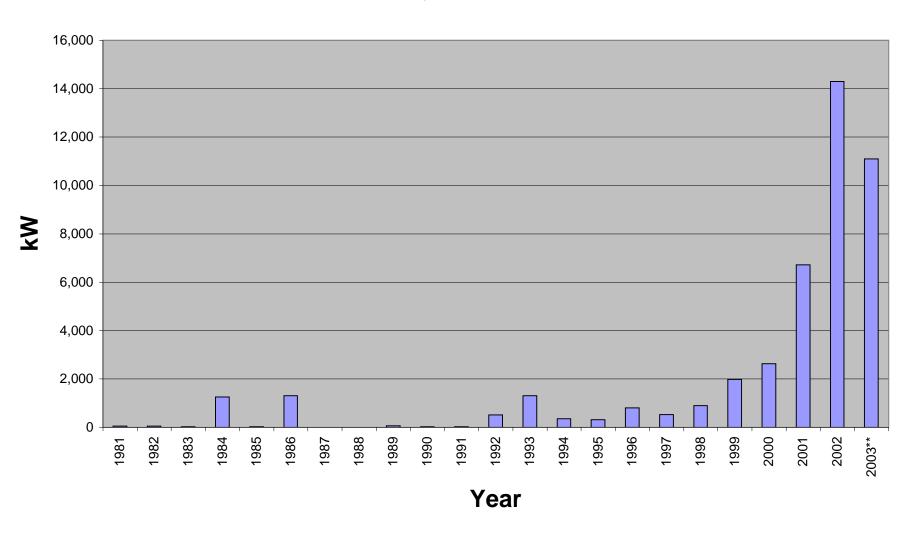
In some cases, the 2002 totals for the smaller utilities reflect the cumulative total of all PV installed, not just the 2002 total.

Many of the utilities contacted had, at one time, a solar rebate program. It is possible other utilities have rebate programs, or other utilities may have installed PV, but those are not accounted for in this summary.

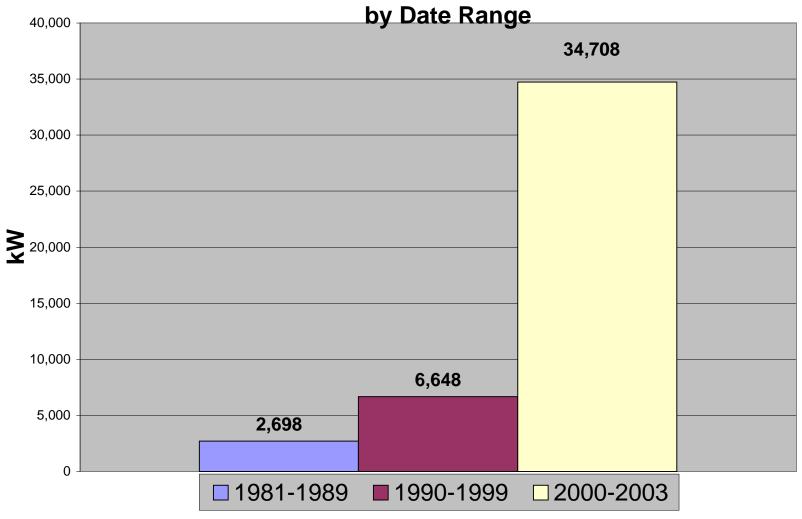
The Energy Commission numbers do not include any Publicly Owned Electric Utility installed systems. The Energy Commission has paid for 309 kW of these systems. However, to avoid double counting, these numbers were subtracted from the yearly totals.

The Southern California Gas Company (SCGC) has paid on over 1 MW of PV. However, the gas company has overlapping territory with several electric utilities that are reporting on the same projects. For consistencies sake, the totals will be reported by electric utilities.

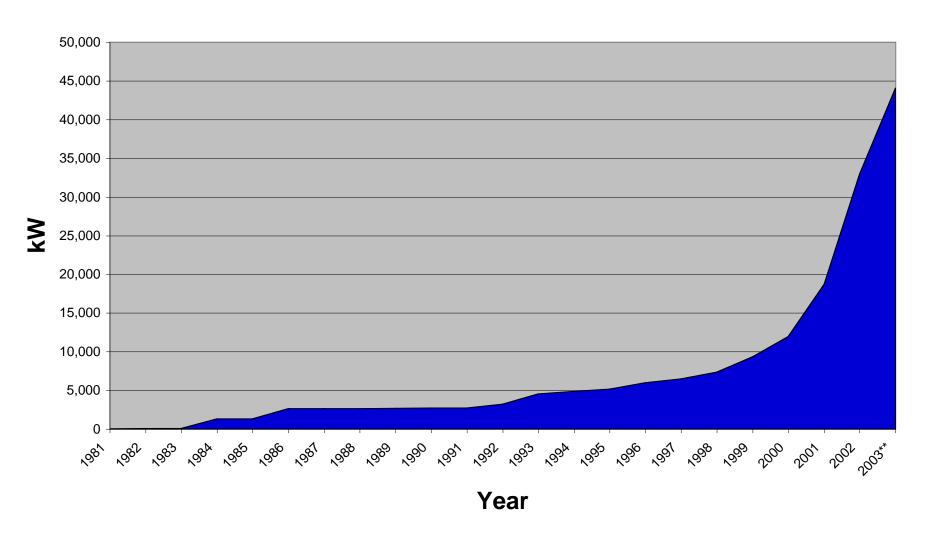
## **Grid-Connected PV Capacity Installed in California By Year**



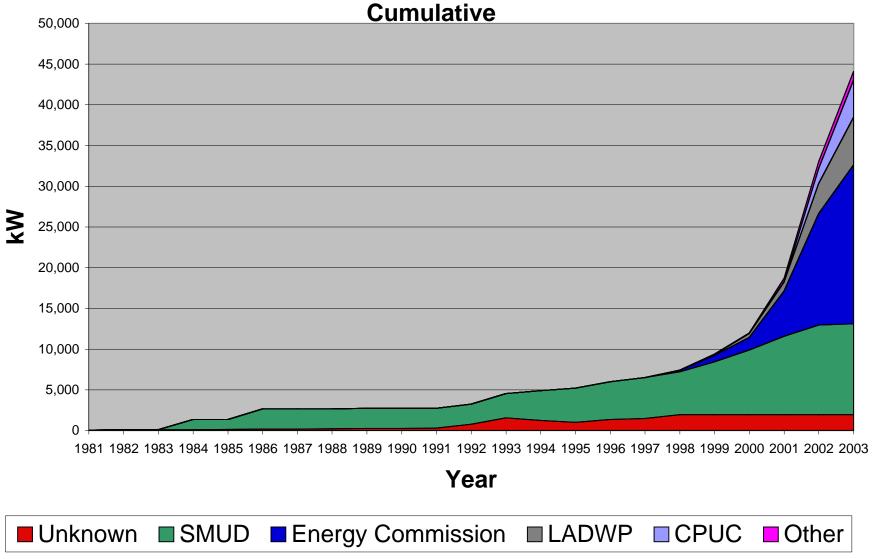
## **Grid-Connected PV Capacity Installed in California**



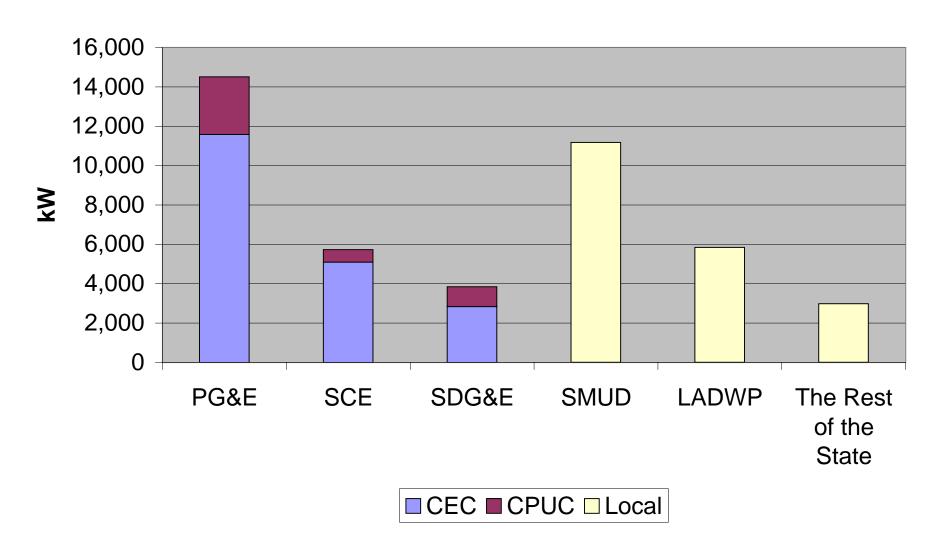
## Grid-Connected PV Capacity Installed in California Cumulative



## **Grid-Connected PV Capacity Installed in California**



## Grid-Connected PV Capacity Installed in California by Service Territory



### Grid-Connected PV Program Contacts in California

**Program** Contact **Telephone Email** California Energy Commission\* 916-653-2834 Dale Trenschel Dtrensch@energy.state.ca.us California Public Utilities 415-703-2565 Commission\* John Galloway jhg@cpuc.ca.gov 415-973-2362 PG&E Dean Heatherington selfgen@pge.com 626-302-8436 SCE Howard Green greenh@sce.com SDG&E 858-244-1177 Mike Magee selfgen@sdenergy.org 213-244-5619 SCGC Marshall Kiyohiro selfgeneration@socalgas.com Sacramento Municipal Utility District Vince Schwent 916-732-6344 vschwen@smud.org Los Angeles Department of Water and Power 213-367-3151 Thomas Honles thomas.honles@ladwp.com City of Palo Alto Utilities 650-329-2680 Lindsay Joye lindsay.joye@cityofpaloalto.org City of Santa Clara Electric Utility 408-244-SAVE Leslie Brown lbrown@ci.santa-clara.ca.us City of Pasadena Water and Power 626-744-6970 Mauricio Mejia mmejia@ci.pasadena.ca.us City of Burbank Water and Power 818-238-3653 John Joyce jjoyce@ci.burbank.ca.us **City of Anaheim Public Utilities** Dina Predisik 714-765-4182 dpredisik@anaheim.net City of Redding Electric Utility 530-339-7215 Pam Brady-Koss pbradykoss@reddingelectricutility.com City of Glendale Water and Electric Ned Bassin 818-548-2748 nbassin@ci.glendale.ca.us City of Riverside Public Utilities 909-826-5790 Atoya Mendez amendez@ci.riverside.ca.us City of Roseville Electric 916-774-5624 Pat Morrison pmorrison@roseville.ca.us 503-813-6052 **Pacific Power** Michael Reid michael.reid@pacificorp.com City of Alameda Power and Telecom Don Rushton 510-748-3946 drushton@alamedapt.com City of Ukiah Public Utilities 707-463-6295 Cindy Sauers cindys@cityofukiah.com 209-333-6800 x City of Lodi Electric Utility Rob Lechner 2583 rlechner@lodielectric.com

### Grid-Connected PV Program Alternate Contacts in California

**Telephone Program** Contact Email California Energy Commission\* Todd Lieberg 916-654-4059 tlieberg@energy.state.ca.us California Public Utilities Commission\* John Galloway 415-703-2565 jhg@cpuc.ca.gov Sara Burmingham 415-973-5187 sebb@pge.com PG&E Robert Thomas 626-302-1746 robert.thomas@sce.com SCE Scott Anders 858-244-1177 san@sdenergy.org SDG&E Tony Prietto 213-244-3679 aprieto@semprautilities.com SCGC **Sacramento Municipal Utility District** Vince Schwent 916-732-6344 vschwen@smud.org Los Angeles Department of Water and **Power** Darryl Gordon 213-367-3250 dgord1@ladwp.com City of Palo Alto Utilities Lindsay Joye 650-329-2680 lindsay.joye@cityofpaloalto.org **City of Santa Clara Electric Utility** 408-244-SAVE Leslie Brown lbrown@ci.santa-clara.ca.us City of Pasadena Water and Power Mauricio Mejia 626-744-6970 mmejia@ci.pasadena.ca.us City of Burbank Water and Power John Joyce 818-238-3653 jjoyce@ci.burbank.ca.us City of Anaheim Public Utilities Dina Predisik 714-765-4182 dpredisik@anaheim.net City of Redding Electric Utility Pam Brady-Koss 530-339-7215 pbradykoss@reddingelectricutility.com Ned Bassin City of Glendale Water and Electric 818-548-2748 nbassin@ci.glendale.ca.us City of Riverside Public Utilities 909-826-5790 Atoya Mendez amendez@ci.riverside.ca.us City of Roseville Electric 916-774-5624 Pat Morrison pmorrison@roseville.ca.us **Pacific Power** 503-813-6052 Michael Reid michael.reid@pacificorp.com City of Alameda Power and Telecom 510-748-3946 Don Rushton drushton@alamedapt.com City of Ukiah Public Utilities 707-463-6295 Cindy Sauers cindys@cityofukiah.com 209-333-6800 x 2583 City of Lodi Electric Utility Rob Lechner rlechner@lodielectric.com

## Grid-Connected PV Capacity in California

#### Graphing Data

### YEAR

	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	Total	
Dragram																									
Program																									
Sacramento Municipal Utility District	0	0	0	1,230	0	1,230	0	0	0	0	0	23	495	675	561	421	405	236	1,220	1,446	1,679	1,390	158	11,169	
California Energy Commission*	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	181	620	726	4,036	8,108	5,846	19,516	
Pacific Gas and Electric	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	61	360	487	2,041	4,949	3,686		11,5
Southern California Edison	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	120	250	133	1,120	2,116	1,352		5,09
San Diego Gas and Electric Bear Valley Electric	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	11 0	106 0	866 10	1,042	805		2,83
Los Angeles Department of Water and Power	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	102	432	589	2,573	2,145	5,841	
California Public Utilities Commission*	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	102	432	009	1,859	2,145	4,550	
Pacific Gas and Electric	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1,671	1.247	4,550	2,9
Southern California Edison	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	114	513		-,6
San Diego Gas and Electric	ō	ō	ō	ō	ō	ō	ō	ō	ō	ō	Ō	Ō	ō	ō	ō	ō	ō	Ö	ō	ō	Ō	74	931		1,0
Southern California Gas Company	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
Pre-1998	37	38	11	12	15	63	0	4	59	15	17	477	806	-336	-250	378	110	464	0	0	0	0	0	1,918	
City of Palo Alto Utilities	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	16	16	99	74	17	223	
City of Santa Clara Electric Utility	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	34	14	4	54	
City of Pasadena Water and Power	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	84	0	84	
City of Burbank Water and Power	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	7	.0	7	
City of Anaheim Public Utilities	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	141	84	19	245	
City of Redding Electric Utility	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	2	
City of Glendale Water and Electric City of Riverside Public Utilities	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	19	0	19	
City of Roseville Electric	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	113 0	15 54	173 29	301 93	
Pacific Power	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	10	9	29	93 19	
City of Alameda Power and Telecom	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	0	0	0	1	0	5	
City of Ukiah Public Utilities	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6	1	7	
City of Lodi Electric Utility	ő	Ö	Ö	0	Ö	Ö	Ö	ő	0	0	Ö	Ö	0	Ö	ő	Ö	Ö	0	Ö	Ö	4	Ö	o O	4	
•																									
Sacramento Municipal Utility District	0	0	0	1,230	1,230	2,460	2,460	2,460	2,460	2,460	2,460	2,483	2,978	3,653	4,214	4,635	5,040	5,276	6,496	7,942	9,621	11,011	11,169		
California Energy Commission*	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	181	801	1,527	5,563	13,670	19,516		
Los Angeles Department of Water and Power	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	102	534	1,123	3,696	5,841		
California Public Utilities Commission*	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1,859	4,550		
Pacific Gas and Electric Southern California Edison	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1,671 114	2,918 627		
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	74	1,005		
San Diego Gas and Electric Southern California Gas Company	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	74	1,005		
Pre-1998	37	75	86	98	112	175	175	179	238	253	270	747	1,552	1.216	966	1,345	1.454	1.918	1.918	1,918	1,918	1,918	1.918		
City of Palo Alto Utilities	0	0	00	0	0	0	0	173	0	0	0	, -,	0	1,210	0	0	0	0,510	1,516	32	131	205	223		
City of Santa Clara Electric Utility	ő	Ö	Ö	0	Ö	Ö	Ö	ő	0	0	Ö	Ö	0	Ö	ő	Ö	Ö	0	0	2	36	50	54		
City of Pasadena Water and Power	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	84	84		
City of Burbank Water and Power	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	7	7		
City of Anaheim Public Utilities	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	141	225	245		
City of Redding Electric Utility	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	2		
City of Glendale Water and Electric	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	19	19		
City of Riverside Public Utilities	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	113	128	301		
City of Roseville Electric	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	9	9	. 9	63	93		
Pacific Power	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	10	19	19		
City of Alameda Power and Telecom	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	4	4	4	5	5		
City of Ukiah Public Utilities City of Lodi Electric Utility	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6 4	7		
City of Loai Electric Offility  Total Other	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	0 29	47	4 448	816	1,060		
Total Other	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	4	29	47	440	010	1,000		
TOTAL	37	38	11	1,242	15	1,293	0	4	59	15	17	500	1,301	339	311	799	515	885	1,967	2,622	6,705	14,298	11,084	44,054	
Cumulative Total	37	75	86	1,328	1,342	2,635	2,635	2,639	2,698	2,713	2,730	3,230	4,530	4,869	5,180	5,980	6,494	7,379	9,346	11,968	18,673	32,970	44,054	• • • • • • • • • • • • • • • • • • • •	

Total by Year Range	1981- 1989	1990- 1999	2000- 2003
	2,698	6,648	34,70
	CEC	CPUC	Local
PG&E	11,583	2,918	
SCE	5,091	627	
SDG&E	2,830	1,005	
SMUD			11,169
LADWP			5,84
The Rest of the State			2,978